Figure S1 : Distribution of PaCO$_2$ (a) and distribution of pH (b)
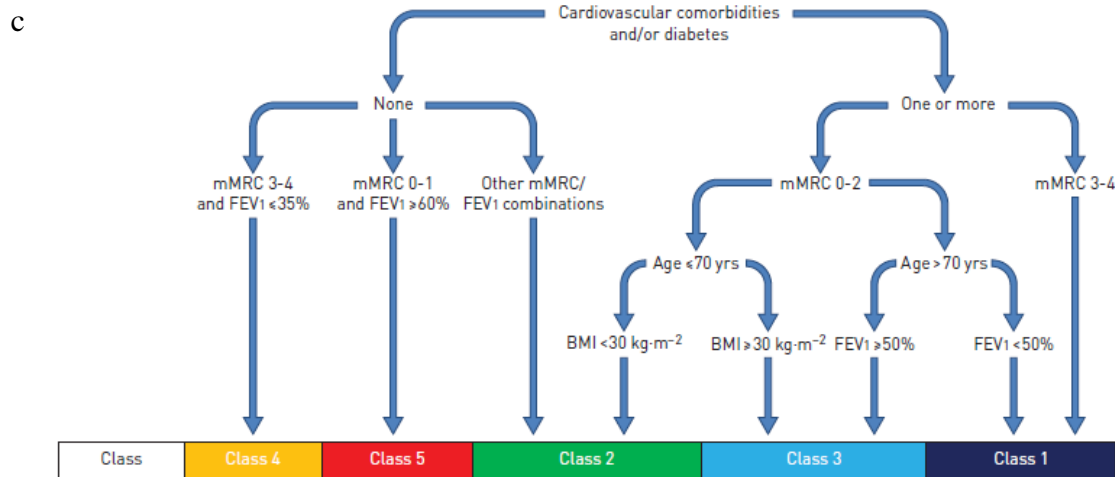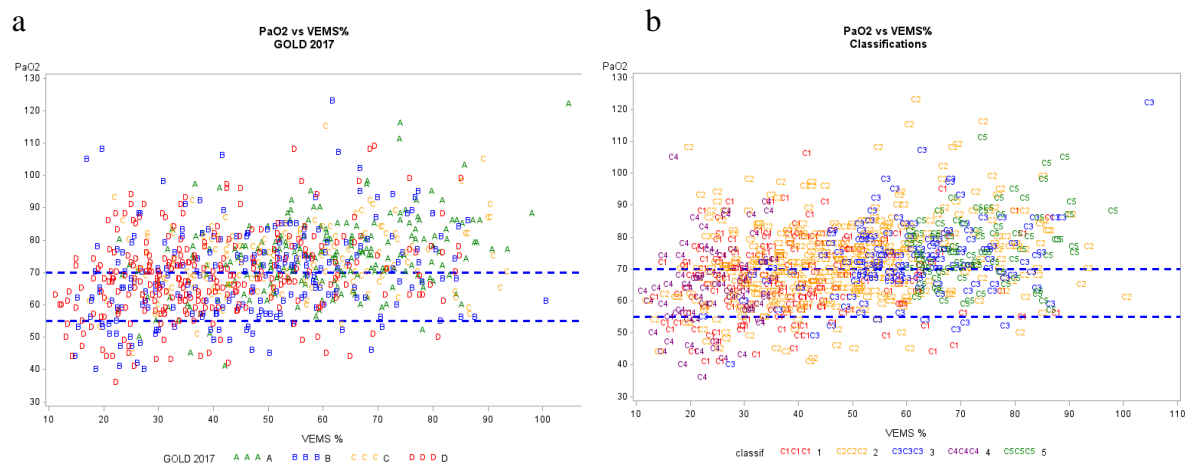

Figure S2: a. Relationships between PaO2 and FEV$_1$, with GOLD 2017 ABCD stage. GOLD A: green, GOLD B: blue, GOLD C: yellow, GOLD D: red. **b. Relationships between PaO2 and FEV$_1$, with CART 1 to 5 distribution.** CART 1: red, CART 2: yellow, CART 3: blue, CART 4: purple, CART 5: green. **C. Algorithm developed by classification and regression tree (CART) analysis for the classification of chronic obstructive pulmonary disease (COPD) patients,** from Burgel *et al.* (9).

Table S1: Comparison between COPD subjects with and without arterial blood gas

	ABG	No ABG	*p*
n, %	887	294	
Age, yr	64 [57-72]	65 [57-71]	NS
Sex, M/F	653/234	206/88	NS
Smoking, pack-yr	40 [25-59]	40 [26-54]	NS
BMI <18,5 kg.m⁻²	9.1% (81)	7.5% (22)	0,02
BMI > 30 kg.m⁻²	22.7% (201)	22.1% (65)	NS
Exacerbations in previous year, n	1 [0-2]	1 [0-3]	0.01
History of asthma	14.1% (125)	14.1% (125)	NS
Hypertension	38.8% (344)	42.5% (125)	NS
Coronary artery disease	13.9% (123)	10.9% (32)	NS
Heart failure	11.4% (101)	9.5% (28)	NS
Diabetes	14.2% (126)	14.3% (42)	NS
Obstructive Sleep Apnea	9.7% (86)	7.5% (22)	NS
mMRC scale	2 [1-3]	1 [1-2]	<0.0001
FEV$_1$, % predicted	48 [33-63]	64 [46-75]	<0.0001
FVC, % predicted	82 [68-98]	91 [77-106]	<0.0001
RV, % predicted	165.9 [131.2-208.6]	151.1 [121.2-191.3]	0.0007
TLC, % predicted	113.2 [100.0-129.1]	112.7 [97.5-122.8]	NS
RV/TLC, %	56.8 [48.5-64.8]	52.1 [41.6-59.0]	0.0001
SGRQ	37 [23-52]	47 [33-60]	<0.0001
Death	8.9% (79)	7.5% (22)	NS

n (%) or median [interquartiles]. ABG: Arterial Blood Gas, BMI: Body Mass Index, FEV1: Forced Expiratory Volume in 1 second, FVC: Forced Vital Capacity, mMRC: modified Medical Research Council, NS : non significant, RV: Residual Volume, SGRQ: Saint Georges Respiratory Questionnaire, TLC: Total Lung Capacity